

HR-339, A Multi-Project Scheduling Procedure for Transportation Projects

Abstract

The Iowa Department of Transportation started requiring Critical Path Method (CPM) schedules two years ago on some larger or more schedule sensitive projects. The specification which has been used has resulted in a variety of CPM approaches by contractors. Recognizing that the current procedures might not be adequate for all projects, the Iowa DOT sponsored a research project to explore the state-of-the-art in transportation scheduling and identify opportunities for improvement. This report proposes, that for certain types of highway construction projects undertaken by the Iowa Department of Transportation, a scheduling technique commonly referred to as linear scheduling may be more effective than the Critical Path Method scheduling technique that is currently being used. The types of projects that appear to be good candidates for the technique are those projects that have a strong linear orientation. Like a bar chart, this technique shows when an activity is scheduled to occur and like a CPM schedule it shows the sequence in which activities are expected to occur. During the 1992 construction season, the authors worked with an inlay project on Interstate 29 to demonstrate the linear scheduling technique to the Construction Office. The as-planned schedule was developed from the CPM schedule that the contractor had developed for the project. Therefore, this schedule represents what a linear representation of CPM schedule would look like, and not necessarily what a true linear schedule would look like if it had been the only scheduling technique applied to the project.

There is a need to expand the current repertoire of scheduling techniques to address those projects for which the bar chart and CPM may not be appropriate either because of the lack of control information or due to overly complex process for the actual project characteristics. The scheduling approaches used today on transportation projects have many shortcomings for properly modeling the real world constraints and conditions which are encountered. Linear project's predilection for activities with variable production rates, a concept very difficult to handle with the CPM, is easily handled and visualized with the linear technique.

It is recommended that work proceed with the refinement of the method of linear scheduling describe above and the development of a microcomputer based system for use by the Iowa Department of Transportation and contractors for its implementation. The system will be designed to provide the information needed to adjust schedules in a rational way for changes in quantities and scope of the projects. The system will provide a simple, understandable method for monitoring progress on the projects and alerting Iowa Department of Transportation personnel when the contractor is deviating from the plan.